



# European Gypsy Moth (EGM) Proposed 2021 Management Plan



Trees & Forests Advisory Committee  
February 24, 2021

# EGM What is it?

- Non-native invasive pest introduced to North America late 1800's
- Introduction into Ontario 1980's and now a well-established pest in southern Ontario
- Canadian Food Inspection Agency (CFIA) responsible for regulating
- Populations are cyclical in nature and tend to peak every 8-10 years; infestations can last for 2-4 years
- Last peak in London 2008/2009



July – April  
Eggs



April – June  
Larvae (Caterpillars)



July – August  
Adult Moths



June – July  
Pupae

# EGM Why is it a Problem?

## Forest Health Concerns

- Caterpillar stage of development creates the most havoc
- Trees at risk (300 species) loves oak trees, maples, birch, pine & spruce
- 1 caterpillar can eat 1 m<sup>2</sup> foliage; 1 egg mass = 100 -1,000 caterpillars
- Multi-year defoliation can make trees more susceptible to pests & diseases
- Decrease in biodiversity of natural areas

## People Concerns

- Impacting enjoyment of parks & backyards (caterpillars in pools on decks, messy)







London  
CANADA


# EGM 2018 Forest Health Conditions

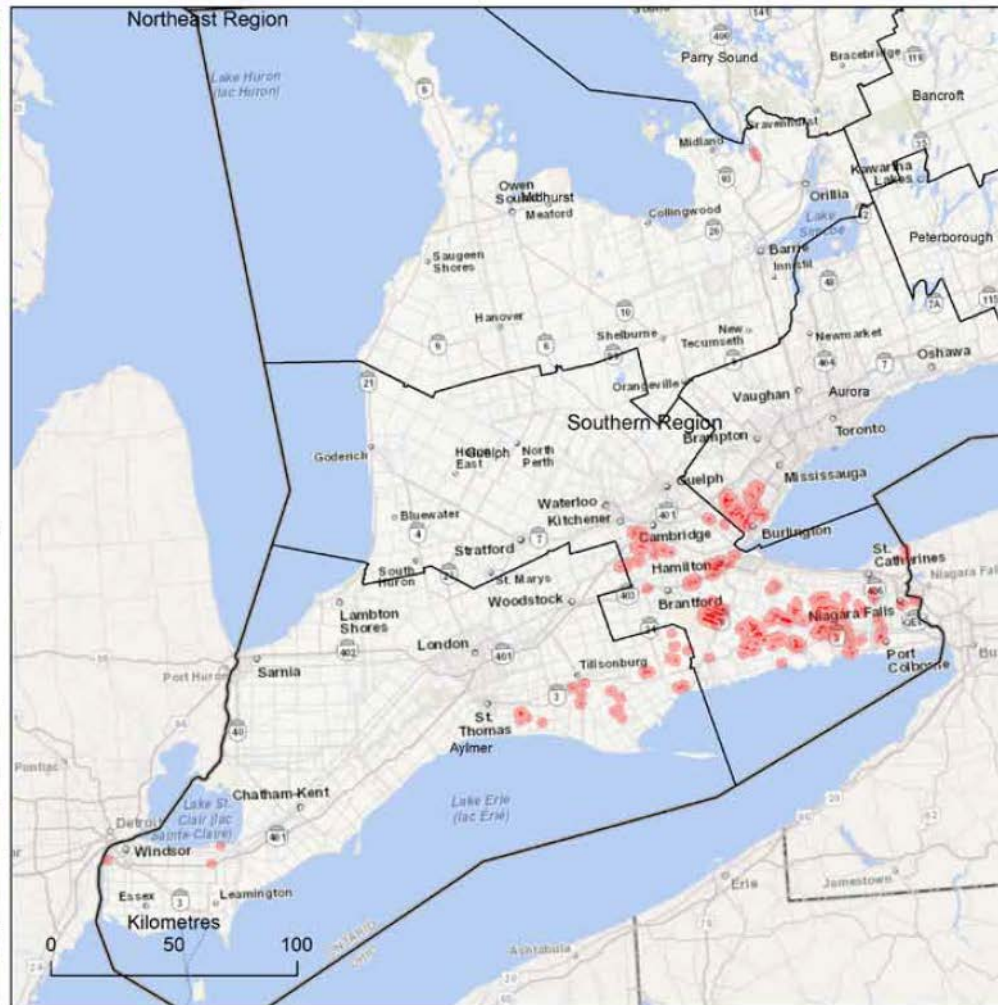


## Gypsy moth 2018

Areas in the Southern Region  
where gypsy moth caused  
defoliation

Moderate to severe = 14,937 ha

 Area of moderate to severe  
defoliation





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# EGM 2019 Forest Health Conditions




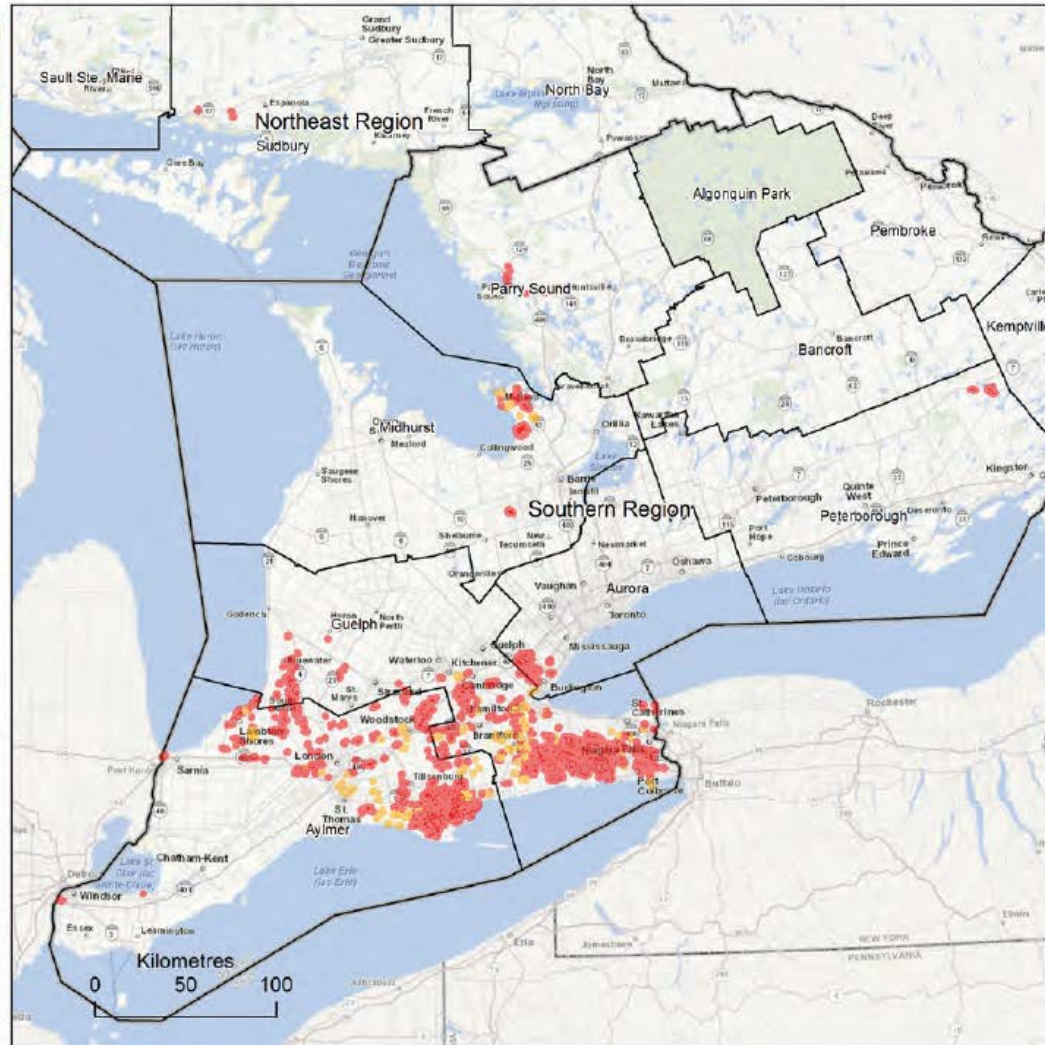
## Gypsy moth 2019

Areas in the Ontario where gypsy moth caused defoliation

Light = 4,046 ha  
Moderate to severe = 43,157 ha

 Area of light defoliation

 Area of moderate to severe defoliation







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# EGM 2020 Forest Health Conditions





## Gypsy moth 2020

Areas in Ontario where gypsy moth caused defoliation

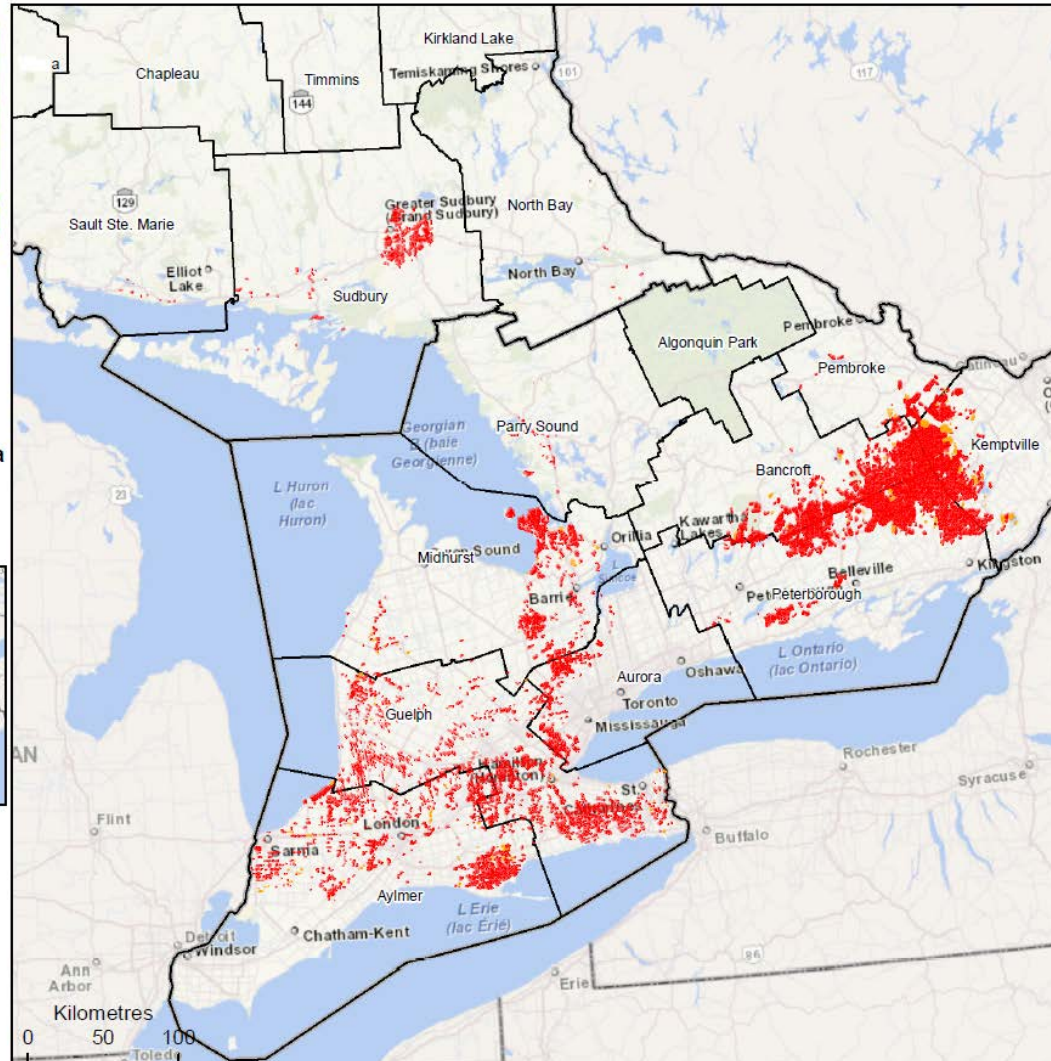
Light = 17,002 ha

Moderate to severe = 569,384 ha

-  Area of light defoliation
-  Area of moderate to severe defoliation

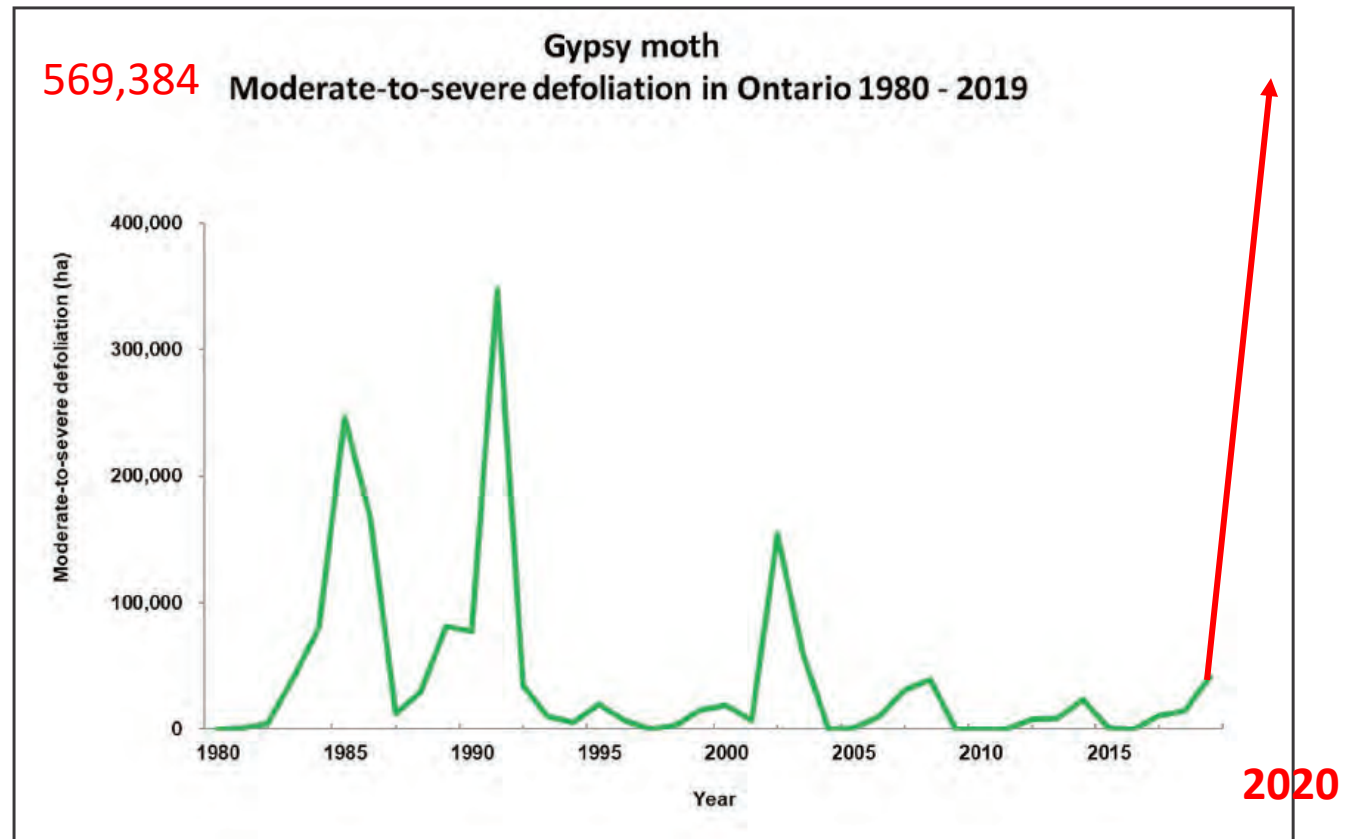


Disclaimer:  
This map is illustrative only. Do not rely on this map as being a precise indicator of routes, locations of features, nor as a guide to navigation. This map was produced by the Ministry of Natural Resources and Forestry.



# EGM Ontario Trending

Area (in hectares) in which gypsy moth caused moderate to severe defoliation in Ontario, 1980 to 2019.





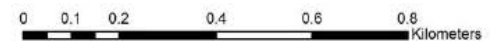
# EGM 2019 Egg Mass Survey Fairmont & Pottersburg Park



## Legend

• City Oak Trees	2020 Defoliation Forecast (Plot)	2020 Defoliation Forecast (Walkthrough)
— Multi-use Paths	● Nil	— Nil
— Roads	● Light	— Light-Moderate
■ City Parks	● Moderate	— Moderate-Heavy
- - - Municipal Wards	● Heavy	— Heavy-Severe
□ Municipal Boundary	● Severe	

**CITY OF LONDON**  
2019 Gypsy Moth Monitoring Program  
Secondary Monitoring Areas





# EGM 2020 Egg Mass Survey & Defoliation Forecast Fairmont Park & Pottersburg Valley



### 2021 Defoliation Forecast

- Nil
- Light to Moderate
- Moderate to Severe
- Severe

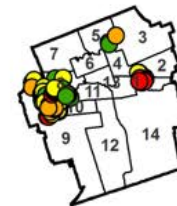
## CITY OF LONDON

### 2020 Gypsy Moth Egg Mass Surveys

0 20 40 80

Kilometers  
NAD 1983 UTM Zone 17N

Produced by Lallemand Inc./BioForest



# EGM Integrated Pest Management (IPM)

## Integrated Pest Management (IPM)

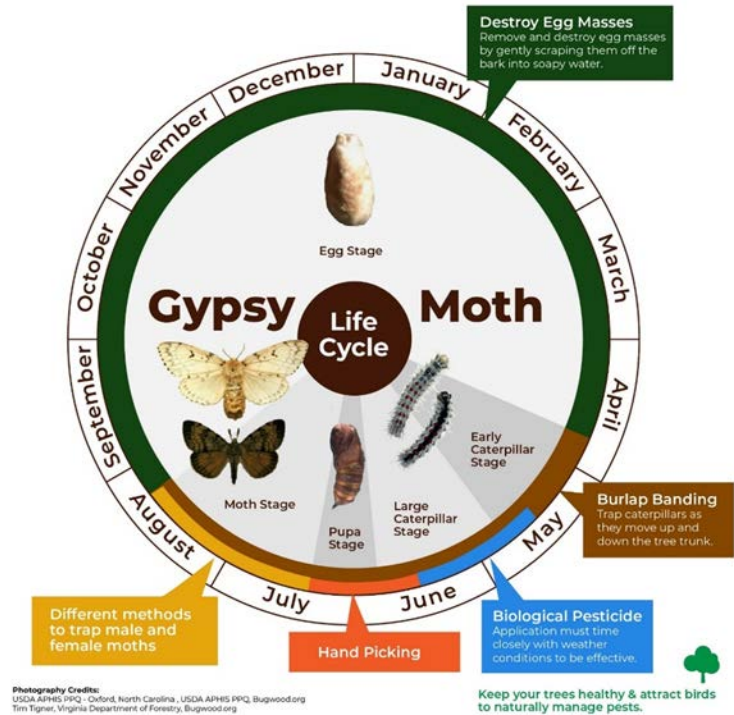
Management strategy that considers the combination of controls to suppress pests effectively, economically and in an environmentally sustainable manner

**Behavioral – Communication & Education**

**Physical – Manual removal of eggs  
Trapping caterpillars**

**Biological - biopesticides**

**Chemical - pesticides**





# EGM What Have We Done

## **Communications**

- Created comprehensive EGM information; graphics
- Creation of “How to videos”
- Social media

## **Forestry Operations (2020 & 2021)**

- City & park trees egg mass scrapings

## **Environmentally Significant Areas (ESAs)**

- UTRCA under contract with the City and managed by City Planning
- Performed egg mass scrapings in Warbler Woods, Kains Woods, Sifton Bog & Kilally Meadows

## **BioForest Consultant**

- Multi-year contract in place
- GIS/GPS plot sampling used to collect survey data street & park trees
- Studies 2- Defoliation surveys (spring/fall) 1- egg mass survey (fall)





# EGM Feedback Form Major Findings

## EGM “Get Involved” Major Findings Feedback

Over 1,400 webpage “impressions” and 393 feedback forms completed. Some summary findings are the following:

- 82% rated their understanding on EGM as not knowledgeable or beginner
- 65% felt that EGM is a community level concern
- 25% thought it impacted the entire City
- 55% had seen EGM on their own or neighbour's private land
- 29% had seen EGM on public lands (ESA, Park, Along streets in City trees)
- 80% responded that Civic Administration should spray on private land with 73% believing that those costs should be paid by all residents through taxes
- 55% rated that their main concern about the impacts of EGM was the decrease in the environment benefits trees provide and potential long term tree decline/death
- 88% of respondents are dissatisfied with Civic Administration’s response to EGM while a very small 5% think a good job is being done



# EGM Proposed Management Plan Comprehensive Communications Plan

## **Recommending the following activities:**

1. Comprehensive EGM Education
2. Scraping egg masses (Aug-May)
3. Wrapping main trunk of trees with burlap (June-July)
4. Handpicking cocoons (June-July)
5. Applying biopesticide (Btk) (mid May)

Lessons learned: Not recommending wrapping trees with sticky tape due to the possible impact of birds and wildlife

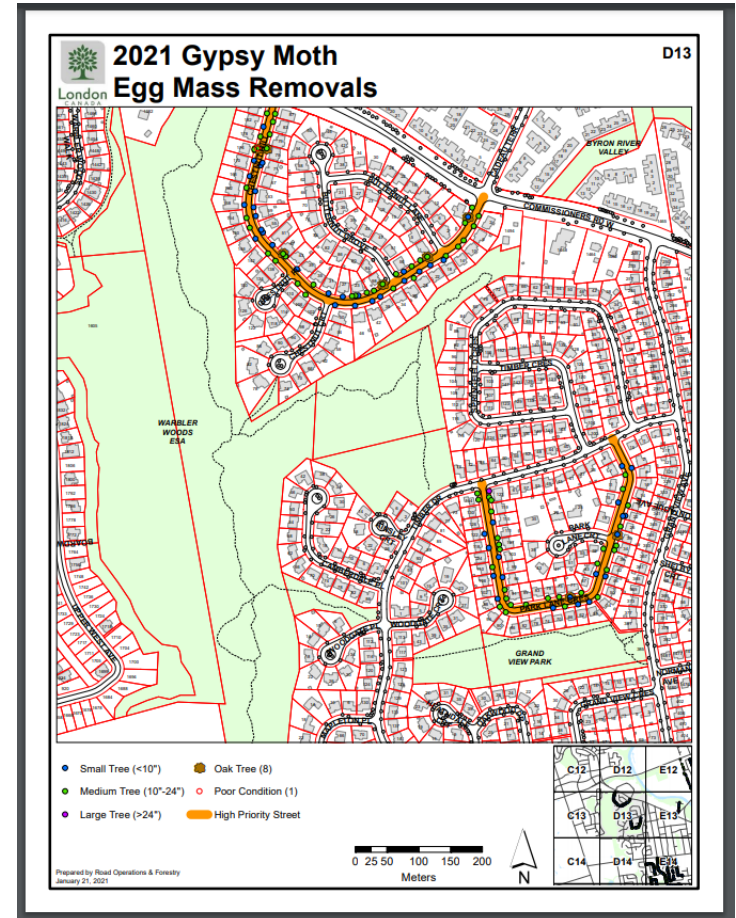
## Suggestions from Feedback Form “Get Involved”

1. Brochures to communities impacted
2. EGM webinar for residents to attend
3. Creation of EGM “Toolbox” for distribution to residents
4. Community volunteers “Egg-stravaganza”

# EGM Proposed Management Plan City Street Trees – Egg Mass Removal

37 streets forecasted to be severely defoliated in 2021 in the following areas:

- Somerset/Byron (revisit)
- Oakridge/Sanatorium Road (new location for 2021)
- Hamilton Rd/Fairmont Park (new location for 2021)







# EGM Proposed Management Plan Btk Aerial Application Locations

Based on data collected the EGM population is healthy,  
growing and moving in London.

#	Location	2020 Actual Defoliation	2020 Egg Masses/Ha	2021 Defoliation Forecast
1	Fairmont Park	Severe	272,033	Severe
2	Grand View Park	Severe	18,425	Severe
3	Griffith Street Park	Severe	47,633	Severe
4	Crestwood Woods	Severe	29,600	Severe
5	Somerset Woods	Severe	15,100	Severe



# What is Btk?

- *Bacillus thuringiensis kurstaki* (Btk) is a bacterium found naturally in soils and is not a chemical
- Btk is the primary pest control product recommended for EGM control
- It is a selective biopesticide that works only against a group of insects called lepidopterans
- Btk only becomes toxic in the alkaline gut of specific lepidopteran insects in the larval (caterpillar) stage of their life cycles; will impact other caterpillars in the same phase as EGM and feeding
- Does not affect **adult** moths and butterflies, other insects, honeybees, fish, birds or mammals



# Btk Application

- Propose a single aerial spray application
- Help trees survive the current infestation and associated severe defoliation
- Other EGM management techniques have had minimal effectiveness
- Reduce EGM populations more effectively on large trees with continuous and intercepting canopies
- Will not impact EGM populations for 2022
- Comprehensive Notification Plan





# Btk Regulations

- Health Canada's Pest Management Regulatory Agency (PMRA) is responsible for ensuring the human health and environmental safety of all pest control products prior to their approval for use in Canada
- Btk is registered as a “restricted” class product which require special permits or licensing from the provincial regulatory authority
- The federal government Health Canada website factsheet states that Btk poses little threat to human health either through handling products directly or through indirect exposure such as during a spray program
- Middlesex-London Health Unit provided an opinion letter for the use of Btk

## Aerial Applicator Contract in Place

- Submit Paperwork Transport Canada

## Ministry of the Environment (MOE)

- Submit Notification Plan for Approval
- Road & Parks Closure Plan

# EGM Outbreak Collapse Natural Process

**Outbreak collapse occurs 2-4 years after peak pest populations with a combination of the following:**

- Cold temperatures  $<-20^{\circ}\text{C}$  for extended period
- Starvation, competition between caterpillars
- Host tree induced defenses (thicker; less nutritious leaves)
- Predators (birds, beetles)
- Parasitism (wasps)



# EGM Outbreak Collapse Natural Process

**Outbreak collapse happen 2-4 years after peak pest populations when a combination of the following occurs:**

Virus NPR (Nucleopolyhedrosis)

- Density dependent mortality
- Greater effect at higher populations of pest

Fungus (Entomophaga maimaiga)

- Greater effect in wet cool spring

